II. Solution by HENRY HEATON, M. Sc., Atlantic, Ia.; WALTER H. DRANE, Harvard University, Cambridge, Mass.; and G. B. M. ZERR, A. M., Ph. D., Chester High School, Chester, Pa.

$$\int \frac{\sqrt{(-1)}b\,dx}{(x-a)^2+b^2} = -\sqrt{(-1)}\tan^{-1}\frac{b}{x-a} = \tfrac{1}{2}\log\left(\frac{x-a-b\sqrt{(-1)}}{x-a+b\sqrt{(-1)}}\right).$$

$$\therefore \tfrac{1}{2}\log\left(\frac{x-a-b\sqrt{(-1)}}{x-a+b\sqrt{(-1)}}\right) = -\sqrt{(-1)}\tan^{-1}\frac{b}{x-a}.$$

$$\therefore \log[x-a-b\sqrt{(-1)}] - \tfrac{1}{2}\log[(x-a^2)+b^2] = -\sqrt{(-1)}\tan^{-1}[b/(x-a)].$$

$$\therefore \log[x-a-b\sqrt{(-1)}] = \tfrac{1}{2}\log[(x-a)^2+b^2] - \sqrt{(-1)}\tan^{-1}[b/(x-a)].$$

PROBLEMS FOR SOLUTION.

ARITHMETIC.

130. Proposed by H. C. WHITAKER, M.E., Ph.D., Professor of Mathematics, Manual Training School, Philadelphia, Pa.

How many balls 1 inch in diameter can be put in a cubical box 2 feet in the clear each way, putting in the maximum number?

131. Proposed by M. A. GRUBER, A. M., War Department, Washington, D. C.

A right frustum of a cone whose radii of the bases are r and s, $r>s$, is to be divided into n parts of equal volume by sections parallel to the bases. What are the altitudes of the respective parts?

*** Solutions of these problems should be sent to B. F. Finkel not later than June 10.

GEOMETRY.

144. Proposed by L. C. WALKER, Assistant in Mathematics in Leland Stanford, Jr., University, Palo Alto, Cal.

Find the equations of four cones that pass through three given straight lines intersecting in the same point.

145. Proposed by FRANK GRIFFIN, Graduate Student, State University, Boulder, Colo.

If A and B be the points of contact, upon two circles X and Y, of tangents drawn from any point of their circle of similitude, then the tangent from A to Y is equal to the tangent from B to X. [From *Casey's Sequel to Euclid*, Part I., page 114.]

*** Solutions of these problems should be sent to B. F. Finkel not later than June 10.

AVERAGE AND PROBABILITY.

95. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Mathematics and Science, Chester High School, Chester, Pa.

Three random points are taken in an ellipse, one on each side of the major axis and the third anywhere in the ellipse. Find the average area of the triangle formed by joining the three points.